



oVirt UI Plugin Infrastructure and the oVirt-Foreman plugin

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Virtualization Devroom

FOSDEM
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Agenda

- oVirt UI-Plugin infrastructure
- Cross-Origin principal
- The oVirt-Foreman UI-plugin
- Future work
- Questions

oVirt Engine UI-Plugin Infrastructure



- ◆ Extend or customize oVirt Engine functionality by allowing to add UI components to the Admin Portal (Webadmin)
- ◆ Plugins integrate with the Admin Portal on the client side using JavaScript
- ◆ Plugins can be packaged and distributed for use with the oVirt Engine

oVirt Engine UI-Plugin Infrastructure

- ◆ Simple and flexible plugin infrastructure
 - ◆ The Admin Portal exposes a plugin API
 - ◆ Plugins consume the API
 - ◆ The Admin Portal invokes plugins at key events during the application runtime
- ◆ Plugins are loaded via iframe elements
 - ◆ Decouple Web Admin application from the actual plugin code
 - ◆ Provide a sandbox environment with regard to plugin code execution

Web Admin user interface



oVirt Open Virtualization Manager

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New Edit Remove Activate Maintenance Configure Local Storage Power Management Assign Tags

Name	Hostname/IP	Cluster	Data Center	Status	Running VMs	Memory	CPU	Network	SPM
dev01aaa	10.34.63.161	MyCluster	MyDC	Up	0	16%	0%	0%	Normal
test	10.34.60.88	Default	Default	Maintenance	0	0%	0%	0%	Normal

Tree

Expand All Collapse All

- System
 - Default
 - MyDC
 - Storage
 - Networks
 - Templates
 - Clusters
 - MyCluster
 - Hosts
 - dev01aaa
 - VMs

Bookmarks

Tags

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Alerts (5) Events Tasks (0)

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General | Virtual Machines | Network Interfaces | Host Hooks | Permissions | Hardware Information | Events

OS Version: RHEL - 6Server - 6.1.0.2.e Active VMs: 0 Physical Memory: 7861 MB total, 1258 MB use
Kernel Version: 2.6.32 - 131.6.1.el6.x86_6 CPU Name: Intel Nehalem Family Swap Size: 1023 MB total, 0 MB used, 1
KVM Version: 0.12.1.2 - 2.184.el6 CPU Type: Intel(R) Xeon(R) CPU Shared Memory: 0%
LIBVIRT Version: 0.9.4 - 7.2.el6 CPU Sockets: 1 Max free Memory for scheduling new VMs: 7605 MB
VDSM Version: vdsd-4.9-104.el6 CPU Cores per Socket: 8 Memory Page Sharing: Inactive
SPICE Version: 0.8.2 - 3.el6 CPU Threads per Core: Unsupported Automatic Large Pages: Always
iSCSI Initiator Name: iqn.1994-05.com.redhat:b:

Action Items
Power Management is not configured for this Host. [Enable Power Management](#)

Last Message: 2013-Jan-09, 17:05 User admin@internal logged in. Alerts (5) Events Tasks (0)

Web Admin user interface



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Search: Host:

Data Centers Clusters **Hosts** Networks Storage Disks Virtual Machines Pools Templates Volumes Users Events

New Edit Remove Activate Maintenance Configure Local Storage Power Management Assign Tags

Name	Hostname/IP	Cluster	Data Center	Status	Running VMs	Memory	CPU	Network	SPM
dev01aaa	10.34.63.161	MyCluster	MyDC	Up	0	16%	0%	0%	Normal
test	10.34.60.88	Default	Default	Maintenance	0	0%	0%	0%	Normal

Tree

Expand All Collapse All

- System
 - Default
 - MyDC
 - Storage
 - Networks
 - Templates
 - Clusters
 - MyCluster
 - Hosts
 - dev01aaa
 - VMs

Bookmarks

Tags

Last Message: 2013-Jan-09, 17:01 User admin@internal logged in.

Alerts (5) Events Tasks (0)

Web Admin user interface



oVirt Open Virtualization Manager

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Search: Host: [x] [star] [magnifying glass]

Hosts | Data Centers | Clusters | Networks | Storage | Disks | Virtual Machines | Pools | Templates | Volumes | Users | Events

New Edit Remove Activate **Maintenance** Configure Local Storage Power Management Assign Tags

Name	Hostname/IP	Cluster	Data Center	Status	Running VMs	Memory	CPU	Network	SPM
dev01aaa	10.34.63.161	MyCluster		Up	0	16%	0%	0%	Normal
test	10.34.60.88	Default		Maintenance	0	0%	0%	0%	Normal

test context menu: New, Edit, Remove, Activate, **Maintenance**, Confirm Host has been Rebooted, Configure Local Storage, Assign Tags

General | Virtual Machines | Network Interfaces | Host Hooks | Permissions | Hardware Information | Events

OS Version: RHEL - 6Server - 6.1.0.2.e Active VMs: 0 Physical Memory: 7861 MB total, 1258 MB use
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iSCSI Initiator Name: iqn.1994-05.com.redhat:b

Action Items
Power Management is not configured for this Host. [Enable Power Management](#)

Bookmarks
Tags

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Pluggable UI Components



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Data Centers Clusters **Hosts** Networks Storage Disks Virtual Machines Pools Templates Volumes Users **Custom Main Tab** Events

New Edit Remove Activate Maintenance Configure Local Storage Power Management Assign Tags **Custom Action Button**

Name	Hostname/IP	Cluster	Data Center	Status	Running VMs	Memory	CPU	Network	SPM
dev01aaa	10.34.63.161	MvCluster	MvDC	Up	0	16%	0%	0%	Normal
test	10.34.60.88			Maintenance	0	0%	0%	0%	Normal

Tree: Expand All Collapse All

System

General Virtual Machines Network Interface **Hardware Information** **Custom Sub Tab** Events

OS Version: RHEL - 6Server - 6.1.0.2.e Active VMs: 0 Physical Memory: 7861 MB total, 1258 MB use
Kernel Version: 2.6.32 - 131.6.1.el6.x86_64 CPU Name: Intel Nehalem Family Swap Size: 1023 MB total, 0 MB used, 1
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SPICE Version: 0.8.2 - 3.el6 CPU Threads per Core: Unsupported Automatic Large Pages: Always
iSCSI Initiator Name: iqn.1994-05.com.redhat:b

Action Items
Power Management is not configured for this Host. [Enable Power Management](#)

Bookmarks

Tags

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Plugin API

- ◆ ready - indicates that the plugin is ready for initialization
- ◆ register - registers plugin event handler functions
- ◆ configObject - returns the plugin configuration object
- ◆ addMainTab - dynamically adds a new main tab
- ◆ addSubTab - dynamically adds a new sub-tab
- ◆ addMainTabActionButton - dynamically adds a new main tab action button + context menu item
- ◆ showDialog - opens some URL in a new browser window/tab

Plugin API

- ◆ `setTabContentUrl` - dynamically changes the URL associated with a sub-tab
- ◆ `setTabAccessible` - dynamically shows/hides a sub-tab
- ◆ `loginUserName` - returns the logged-in user name
- ◆ `loginUserId` - returns the logged-in user name

Plugin Events

- ◆ Uilnit - code that runs upon plugin initialization
- ◆ UserLogin - indicates that the user logged in
- ◆ UserLogout - indicates that the user logged out
- ◆ RestApiSessionAcquired – the plugin infrastructure creates a REST session for the plugin to use
- ◆ Selection Changes
 - ◆ DataCenter, Cluster, Disk, Host, Storage, Template, VirtualMachine
 - ◆ Event name is <Entity>SelectionChange where Entity is one of the above

Same-Origin Policy

- ◆ Security concept for browser-side programming languages such as JavaScript
- ◆ Permits scripts running on pages from the same site to access each others properties and methods, while restricting access to methods and properties across pages on different sites
- ◆ One JavaScript code that originates from one end point (`http(s)://server1:port1`) cannot access another endpoint's properties and methods

Same-Origin Policy in UI-Plugins

- ◆ In our case, the plugin's origin is the URL of the engine server (`http(s)://engine-server:port`)
- ◆ Plugin code can't do HTTP requests to a different origin and access the response, different properties and methods in it

Approaches to deal with the Same-Origin Policy



- ◆ Rendering URL in an iframe is allowed (so if you just want main/sub-tabs to work, then you're good)
- ◆ JSONP – JSON with padding
- ◆ CORS – Cross Origin Resource Sharing
- ◆ Using a proxy (or in specific, Apache's mod_proxy or mod_ssl)

Rendering URL in an iframe

- ◆ If you would like to show a specific URL (using HTTP GET) in a main/sub-tab, and constructing the URL doesn't require any information from the other origin, then just do it
- ◆ However, if you do need information, then perhaps the next approach will be good for you
- ◆ Pros
 - ◆ Simple
- ◆ Cons
 - ◆ Very limited and specific use-case

Using JSONP

- ◆ JSON with padding
- ◆ Enabled you to get JSON data (HTTP GET) from a server in a different origin
- ◆ Useful if you need JSON data to construct URLs to for the main/sub-tab iframe

Using JSONP - Example

- Define some callback

```
var doSomethingCallback = function doSomething(data) {  
    alert(JSON.stringify(data));  
}
```

- Use JQUERY to get the JSON data, passing a callback argument

```
$.getJSON('http://different-server/data.json&callback=?',  
doSomethingCallback);
```

- The result would be

```
doSomethingCallback({ "my_data" : "this is my data" })
```

- And it would call the callback, which will get the data

Using JSONP

- ◆ Pros
 - ◆ Simple
- ◆ Cons
 - ◆ Requires server-side support
 - ◆ Only supports getting JSON data
 - ◆ Need to adapt client code to work with JSONP (simple)

CORS – Cross Origin Resource Sharing



- ◆ CORS is a mechanism that allows a web page to make requests to another domain
- ◆ Client request should contain the HTTP Header
 - ◆ Origin: `http://my-server.example.com`
- ◆ Response
 - ◆ Access-Control-Allow-Origin:
`http://my-server.example.com` (or * for all)
- ◆ Pros
 - ◆ Supports operations other than HTTP GET on JSON
- ◆ Cons
 - ◆ Requires both browser and server-side support

Using a Proxy

- ◆ One can define a proxy, that once calling one origin, will make the request to the other origin
- ◆ Thus, it is the client side both requests are in the same origin
- ◆ Example using Apache's mod_proxy
 - ◆ ProxyPass /other_origin http://other-server:other-port/other_application
 - ◆ ProxyPassReverse /other_origin http://other-server:other-port/other_application
- ◆ Requests to http://my-server/other_application are safe to use from within the originating application, and allows all the freedom you need

Using a Proxy

◆ Pros

- ◆ No changes needed in the client code
- ◆ No browser support needed

◆ Cons

- ◆ Using a proxy does have some overhead
- ◆ requires special configuration at the originating server-side

oVirt-Foreman UI-Plugin

Foreman Overview

- ▶ Machines Life Cycle Management
 - ▶ Integrates with Puppet, and acts as web front end to it
 - ▶ Provisioning until the point puppet is running, allowing Puppet to do what it does best
 - ▶ Shows a Systems Inventory (based on Facter)
 - ▶ Provides real time information about hosts status based on Puppet reports
 - ▶ Managing virtualization and cloud environments
 - ▶ Managing DNS, DHCP, TFTP, PuppetCA, CMDB etc
- ▶ oVirt-Foreman integration
 - ▶ See Foreman data on oVirt Vms
 - ▶ Dashboard
 - ▶

Current Scope

- ◆ Dashboard Main-Tab
- ◆ VM Foreman Details Sub-Tab – Shows the Foreman Host Details
- ◆ VM Foreman Graphs Sub-Tabs – Shows the Foreman Host Graphs only
- ◆ Behind the scenes - SSO between oVirt and Foreman

oVirt Plugin – Dashboard



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Data Centers

Clusters

Hosts

Networks

Storage

Disks

Virtual Machines

Pools

Templates

Volumes

Users

Foreman Dashboard

Events

Tree

Expand All Collapse All

System

Generated at 20 Dec 13:41

Description	Data
Hosts that had performed modifications without error	0
Hosts in Error State	0
Good Host Reports in the last 35 minutes	0 / 4 hosts (0%)
Hosts that had pending changes	0
Out Of Sync Hosts	0
Hosts With No Reports	4
Hosts With Alerts Disabled	0

Puppet Clients Activity Overview

Puppet Clients Activity Overview

Notification disabled: 0Active: 0Error: 0OK: 0Pending changes: 0Out of sync: 0No report: 4

Run Distribution in the last 30 Minutes

Number Of Clients

0.050.040.030.020.010

30 Minutes ago27 Minutes ago24 Minutes ago21 Minutes ago18 Minutes ago15 Minutes ago12 Minutes ago9 Minutes ago6 Minutes ago3 Minutes ago

Bookmarks

Tags

Last Message: 2012-Dec-20, 16:32 User admin@internal logged in.

Alerts (1)EventsTasks (0)

oVirt Plugin – VM Foreman Details



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Search: Vms: [x] [star] [magnifying glass]

Tree

- Expand All Collapse All
- System

Virtual Machines

Name	Host	IP Address	Cluster	Data Center	Memory	CPU	Network	Display	Status	Uptime	Logged-in User
aaa			europa-cl	europa	0%	0%	0%		Down		
abcd1-redhat.com	10.35.1.160		Default	Default	0%	0%	0%	VNC	Up	9 days	admin@internal
abcd-redhat.com			Default	Default	0%	0%	0%		Down		
c-1353422137			Default	Default	0%	0%	0%		Down		
cimi_machine			ZZZ-barcelona	Default	0%	0%	0%		Down		
cimi_machine1			ZZZ-barcelona	Default	0%	0%	0%		Down		
cimi_machine222			ZZZ-barcelona	Default	0%	0%	0%		Down		
desktop			Default	Default	0%	0%	0%		Down		

Foreman Details

General Network Interfaces Disks Snapshots Applications Permissions Foreman Details Foreman Graphs Events

Properties Metrics Templates Virtual Machine

Properties	
Domain	redhat.com
IP Address	1.2.3.4
MAC Address	00:1a:4a:16:01:b5
Puppet Environment	puppet
Host Architecture	x86_64
Operating System	oved 9.2
Host Group	new
Owner	Admin User
Certificate Name	abcd1.redhat.com

Runtime
last 7 days

Time in Seconds

■ Runtime ■ Config Retrieval

Resources
last 7 days

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Alerts (1) Events Tasks (0)

oVirt Plugin – VM Foreman Graphs



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Search: Vms:

Tree

- Expand All
- Collapse All
- System

Virtual Machines

Name	Host	IP Address	Cluster	Data Center	Memory	CPU	Network	Display	Status	Uptime	Logged-in User
aaa			europa-cl	europa	0%	0%	0%		Down		
abcd1-redhat-com	10.35.1.160		Default	Default	0%	0%	0%	VNC	Up	9 days	admin@internal
abcd-redhat-com			Default	Default	0%	0%	0%		Down		
c-1353422137			Default	Default	0%	0%	0%		Down		
cimi_machine			ZZZ-barcelona	Default	0%	0%	0%		Down		
cimi_machine1			ZZZ-barcelona	Default	0%	0%	0%		Down		
cimi_machine222			ZZZ-barcelona	Default	0%	0%	0%		Down		
desktop			Default	Default	0%	0%	0%		Down		

Foreman Graphs

Runtime last 7 days

Time in Seconds

■ Runtime ■ Config Retrieval

Resources last 7 days

Last Message: 2012-Dec-20, 16:39 User admin@internal logged out.

Alerts (1) Events Tasks (0)

oVirt Plugin

- ♦ The oVirt UI-plugin is composed of 2 files
 - ♦ foreman.json – contains the plugin definition file
 - ♦ foreman_files/start.html – contains the plugin itself
- ♦ Custom configuration can be put in
 - ♦ /etc/ovirt-engine/ui-plugins/foreman-config.json

oVirt Plugin – Definition file



◆ foreman.json

```
{
  // A name that uniquely identifies the plugin (required)
  "name": "foreman",

  // URL of plugin host page that invokes the plugin code
  "url": "/webadmin/webadmin/plugin/foreman/start.html",

  // Default configuration object associated with the plugin
  "config": {
    "url": "http://ovirt-engine.example.com/foreman",
    "loginUrl": "http://ovirt-engine.example.com/foreman/users/login",
    "logoutUrl": "http://ovirt-engine.example.com/foreman/users/logout",
    "foremanDetailsLabel" : "Foreman Details",
    "foremanGraphsLabel" : "Foreman Graphs",
    "foremanDashboardLabel" : "Foreman Dashboard",
    "ovirtUserNamePrefix" : "ovirt_"
  },

  // Path to plugin static resources
  // Used when serving plugin files through PluginResourceServlet
  // This path is relative to /usr/share/ovirt-engine/ui-plugins
  "resourcePath": "foreman-files"
}
```

oVirt Plugin – start.html file



- ◆ Register section - register the following event handlers
 - ◆ Uilnit – add the main/sub tabs

```
UiInit: function() {  
    // Foreman Details will show the details of the Foreman Host that matches the VM  
    // URL will be change upon VM selection event  
    api.addSubTab('VirtualMachine', conf.foremanDetailsLabel, 'foreman-details', '');  
  
    // Foreman Graphs will show the different Graphs of the Foreman Host that matches the VM  
    // URL will be change upon VM selection event  
    api.addSubTab('VirtualMachine', conf.foremanGraphsLabel, 'foreman-graphs', '');  
  
    // We hide both sub-tabs until some VM is selected  
    setAccessibleVmForemanSubTabs(false);  
  
    // Dashboard Main Tab  
    api.addMainTab(conf.foremanDashboardLabel, 'foreman', conf.url + '/dashboard/ovirt');  
},
```


oVirt Plugin – start.html file



◆ RestApiSessionAcquired – relogin to Foreman

```
RestApiSessionAcquired: function(sessionId) {  
    var userName = conf.ovirtUserNamePrefix + api.loginUserName();  
    relogin(conf.logoutUrl, conf.loginUrl, userName, api.loginUserId(), sessionId);  
},
```

◆ VirtualMachineSelectionChange – set sub-tabs URL if the selected VM exists in Foreman

```
VirtualMachineSelectionChange: function() {  
    setAccessibleVmForemanSubTabs(false);  
    if (arguments.length == 1) {  
        var vmId = arguments[0].id;  
        var vmName = arguments[0].name;  
        var foremanSearchHostUrl = conf.url + '/hosts?&search=' +  
            encodeURIComponent('uuid=' + vmId) + '+or+' +  
            encodeURIComponent('name=' + vmName) + '&format=json';  
  
        // Get the relevant host URLs and set up the Sub-Tabs accordingly  
        $.getJSON(foremanSearchHostUrl, function (data) {  
            try {  
                // If a host was returned we set the show the Sub-Tabs  
                if (data[0] != null) {  
                    showVmForemanSubTabs(data[0].host.name);  
                }  
            } catch (err) {  
                // We do nothing here. The tab will remain inaccessible  
            }  
        });  
    }  
},
```

oVirt Plugin – start.html file

- ◆ UserLogout – logout from Foreman

```
UserLogout: function() {  
    // Logging out from Foreman as well  
    $.get(conf.logoutUrl, { });  
}
```

oVirt Plugin – start.html file



◆ Helper functions

```
var api = parent.pluginApi('foreman');
var conf = api.configObject();

function setAccessibleVmForemanSubTabs(shouldShowSubTabs) {
    api.setTabAccessible('foreman-details', shouldShowSubTabs);
    api.setTabAccessible('foreman-graphs', shouldShowSubTabs);
}

function showVmForemanSubTabs(hostName) {
    try {
        setAccessibleVmForemanSubTabs(false);
        var foremanUrl = conf.url + '/hosts/' + hostName;
        var foremanVmDetailsUrl = foremanUrl + '/ovirt';
        var foremanVmGraphsUrl = foremanUrl + '/graphs/ovirt';
        api.setTabContentUrl('foreman-details', foremanVmDetailsUrl);
        api.setTabContentUrl('foreman-graphs', foremanVmGraphsUrl);
        setAccessibleVmForemanSubTabs(true);
    } catch (err) {
        // We do nothing here. The tab will remain inaccessible
    }
}
```

Foreman Plugin

- ♦ The Foreman plugin composed of several components
 - ♦ `config/initializers/ovirt_setup.rb`
 - ♦ Adds new oVirt role to Foreman
 - ♦ Adds oVirt authentication sources – one per oVirt compute resource
 - ♦ `models/foreman_ovirt/auth_source_ovirt.rb`
 - ♦ The oVirt authentication source model
 - ♦ `models/foreman_ovirt/user_extensions.rb`
 - ♦ Every-time a user logs in through the oVirt authentication source, it is granted with the oVirt role automatically
 - ♦ Views and Layouts
 - ♦ Customized oVirt layout
 - ♦ Customized host view

Foreman Plugin

◆ Hosts controller

```
module ForemanOvirt
  class HostsController < ::HostsController

    layout 'layouts/application_ovirt'

    def show
      super
    end

    def show_graphs
      @host = ::Host.find_by_name(params[:id])
      show
    end
  end
end
```

Foreman Plugin

➤ Dashboard controller

```
module ForemanOvirt
  class DashboardController < ::DashboardController

    layout 'layouts/application_ovirt'

    def index
      render :action => 'dashboard/index'
    end
  end
end
```

Installation

- ◆ Prerequisites
 - ◆ oVirt version 3.2
 - ◆ Foreman version 1.1 RC2 and above

Installation

◆ Foreman side

- ◆ Add a file called `foreman_ovirt.rb` under the `bundler.d` directory containing
 - ◆ `gem 'foreman_ovirt'`
- ◆ Run `Bundle install` from the foreman root directory
- ◆ Foreman needs to run in `/foreman` URL root either by
 - ◆ Export `RAILS_RELATIVE_URL_ROOT="/foreman"` before running Foreman
- ◆ or by setting the following definition in `/etc/sysconfig/foreman`
 - ◆ `RAILS_RELATIVE_URL_ROOT="/foreman"`
- ◆ Run Foreman

Installation



♦ oVirt side

- ♦ Get the plugin files from [git://gerrit.ovirt.org/samples-uiplugins.git](http://gerrit.ovirt.org/samples-uiplugins.git)
- ♦ Place the files from the foreman-plugin directory to `/usr/share/ovirt-engine/ui-plugins`, and edit the `foreman.json` file as needed

♦ Configure mod_proxy

```
ProxyPassMatch ^/(foreman)(/.*)?$ http://foreman_server:foreman_port/$1$2
ProxyPassReverse /foreman http://foreman_server:foreman_port/foreman
ProxyPass /webadmin http://engine-server:engine-port/webadmin
ProxyPassReverse /webadmin http://engine-server:engine-port/webadmin|
ProxyPass /api http://engine-server:engine-port/api
ProxyPassReverse /api http://engine-server:engine-port/api
```

- ♦ Restart the engine and Apache, and you're good to go! (make sure you browse to the URL as defined in the proxy, otherwise it won't work)
- ♦ If you already have oVirt engine proxy configuration just add the foreman ones
- ♦ For SSL configuration check <http://ovedou.blogspot.com>

Future Work – UI plugin infrastructure

- Custom dialogs in Web Admin UI style
- Form and table based custom {main|sub} tabs
- Review and manage plugins in Web Admin UI
- What do you want to see?

Future Work – Foreman plugin

- ◆ Support sync oVirt VMs with Foreman Hosts (either in the oVirt or Foreman side)
- ◆ RPM packages for both sides of the plugin
- ◆ Other data that might be relevant
 - ◆ Reports
 - ◆ Facts

Useful Links

- ◆ foreman_ovirt github repo
https://github.com/oourfali/foreman_ovirt
- ◆ oVirt-Foreman UI plugin in the UI plugins repo
<http://gerrit.ovirt.org/gitweb?p=samples-uiplugins.git;a=summary>
or just git clone [git://gerrit.ovirt.org/samples-uiplugins.git](http://gerrit.ovirt.org/samples-uiplugins.git)
- ◆ Feel free to contact me for help, either personally, or via the oVirt users mailing list
<http://ovedou.blogspot.com>
ovedo@redhat.com
users@ovirt.org
- ◆ Daniel's blog (Shell in a Box plugin)
<http://derezvir.blogspot.co.il>



THANK YOU !

<http://www.ovirt.org>

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